

- Brown, J. L. & Horvath, E. G. 1989. Geographic variation of group size, ontogeny, rattle calls, and body size in *Aphelocoma ultramarina*. *Auk* 106: 124–128.
- Dixon, K. L. 1952. Scrub Jay in Bexar County, Texas. *Condor* 54: 208.
- Escalante P., P. 1988. *Aves de Nayarit*. Univ. Autón. Nayarit, Tepic.
- Fitton, S. D. & Scott, O. K. 1984. Wyoming's juniper birds. *Western Birds* 15: 85–90.
- Fitzpatrick, J. W. & O'Neill, J. P. 1979. A new tody-tyrant from northern Peru. *Auk* 96: 443–447.
- Mayr, E. 1963. *Animal Species and Evolution*. Belknap Press, Cambridge, Mass.
- Miller, A. H. 1955. The avifauna of the Sierra del Carmen of Coahuila, Mexico. *Condor* 57: 154–178.
- Miller, A. H., Friedmann, H., Griscom, L. & Moore, R. T. 1957. Distributional check-list of the birds of Mexico, part II. *Pacific Coast Avifauna* no. 33.
- Morales Perez, J. E. 1969. Distribución de la avifauna en la Sierra de Taxco, Guerrero. Tesis profesional, Facultad de Ciencias, U.N.A.M., Mexico.
- Peterson, A. T. & Vargas B., N. In press. Ecological diversity in Scrub Jays (*Aphelocoma coerulescens*). In T. P. Ramamoorthy *et al.* (eds), *The Biological Diversity of Mexico*. Oxford Univ. Press.
- Phillips, A. R. 1986. *The Known Birds of North and Middle America*, part 1. Allan Phillips, Denver.
- Pitelka, F. A. 1945. Pterylography, molt, and age determination of American jays of the genus *Aphelocoma*. *Condor* 47: 229–260.
- Pitelka, F. A. 1951. Speciation and ecologic distribution in American jays of the genus *Aphelocoma*. *Univ. Calif. Publ. Zool.* 50: 195–464.
- Pitelka, F. A. 1961. Comments on types and taxonomy in the jay genus *Aphelocoma*. *Condor* 63: 234–245.
- Woolfenden, G. E. & Fitzpatrick, J. W. 1984. *The Florida Scrub Jay: demography of a cooperative breeding bird*. Princeton Univ. Press.

Address: A. Townsend Peterson, Committee on Evolutionary Biology, The University of Chicago, Chicago, Illinois 60637, U.S.A. Current address: Museum of Natural Science, 119 Foster Hall, Louisiana State University, Baton Rouge, Louisiana 70803, U.S.A.

© British Ornithologists' Club 1991

Observations on nesting and nestling growth in the Rusty-margined Flycatcher *Myiozetetes cayanensis* in southeastern Peru

by Andrzej Dyrce

Received 5 July 1990

Information on the breeding biology of the Rusty-margined Flycatcher is scarce (Haverschmidt 1971). Below I give some new data.

In November and December 1985 I observed Rusty-margined Flycatchers which nested at an oxbow lake (Laguna Chica) in lowland rain forest in Tambopata Reserve, Puerto Maldonado, southeastern Peru. The species was first found there in 1978 (Parker 1982). Two nests were found at the edge of the oxbow. They were situated on small bushes growing in the water, and were 100 and 140 cm above water level. They had a more or less oval shape with a well-formed roof over the top. The

TABLE 1
Growth parameters of a Rusty-margined Flycatcher nestling

Age, days	Weight (g)	Body length (mm)	Tarsus length (mm)	Wing length (mm)	Bill length (mm)	Length of 9th primary (mm)	Length of 2nd tail feather (mm)
2	3.5	40	7.6	—	—	0	0
3	5.0	41	9.7	9.4	4.9	0	0
4	6.5	48	9.9	11.3	5.8	0	0
5	8.5	52	10.4	11.6	7.0	0.4	0.3
6	10.0	59	12.3	14.6	7.8	1.1	1.5
7	12.5	61	14.0	16.8	8.5	3.8	1.8
8	14.5	66	15.2	17.1	8.7	8.9	3.8
9	15.5	75	15.9	20.0	9.9	10.6	3.8
10	18.5	79	16.9	21.4	10.2	15.0	5.6
11	19.0	83	18.6	22.4	10.9	18.7	11.6
12	21.5	88	20.5	23.0	11.2	23.9	11.8
13	21.5	94	21.2	23.3	11.4	28.0	13.6
14	24.0	98	21.4	24.2	11.9	32.8	15.5
15	24.0	100	21.6	25.0	13.0	36.3	17.5
16	24.0	101	22.0	25.5	13.5	39.1	21.2
17	25.5	102	22.2	25.5	13.9	41.1	23.5
18	25.0	102	22.5	25.5	13.9	44.6	26.5
19	24.5	104	22.5	25.5	14.0	47.8	30.4
20	25.5	104	22.5	25.5	14.0	47.8	38.6

outer wall was constructed of coarse grasses, small twigs, lichens and other material, the inner chamber of fine grasses and pappus of unidentified seeds. The diameter of the side entrance of one nest was 4 cm and the diameter of its chamber was 9 cm. The weight of the dry nest was 54 g.

In the first nest the first egg was laid between 9 and 11 November. The clutch was two eggs (21.4×16.6 mm, 20.3×15.7 mm). The weights of the fresh eggs were 3.25 and 2.75 g. The smaller egg did not contain any visible embryo. The single nestling hatched on 26 November, and was measured and weighed every day between 15.00 and 16.00 hrs up to the 19th day of life. The length of the body was measured from the tip of the bill to the end of the pygostyle. The flattened chord length of the wing was measured; the tarsus was measured from bend to bend, and the bill from skull to tip. All the measurements were taken to the nearest 0.1 mm (except body length to the nearest 1 mm), and the weight to the nearest 0.5 g. The data are presented in Table 1.

The colour of the skin at 2 days old was yellowish-orange and in the following days became darker; the upperparts were covered by a yellowish-white down. Primaries and tail feathers became visible on the 5th day of life, the eyes opened on the 6th day, and the vanes of contour feathers started to appear on the 13th day. On the 18th day of life the nestling was completely covered by feathers. It left the nest when 21 days old. I visited the nest again on 29 December, and saw the colour-ringed,

34-day-old young in its vicinity. Generally, it looked like an adult bird, except that the yellow underparts were paler. During one hour of observation it begged three times in vain; the adults were mildly aggressive to it. Eventually it flew to the other side of the oxbow.

In the second nest, the first egg was laid on 28 November. Altogether, three eggs were laid (23.6×16.8 , 23.2×16.7 , 22.6×17.2 mm); one per day. This differs from Haverschmidt's (1971) observation that the eggs are laid on alternate days. Three days after completion of the clutch the eggs disappeared. Later a new nest was constructed 15 m away, probably with material from the old one which had disappeared. Soon the water level in the river nearby rose unusually high, the whole region was flooded and observations ended.

The growth curve of the Rusty-margined Flycatcher nestling weight differs from those of some other species studied in the neotropics (e.g. Dyrce 1983, 1984). The growth was slow and at the end of the nestling period there were marked fluctuations in growth rate. The maximum weight was reached on the 17th day of life. When it left the nest the fledgling weighed about 85% of adult weight.

For purposes of comparison of growth rates between species, irrespective of body size, it is convenient to use the growth rate constant K , derived from the curve of the logistic equation to which observed growth rates of birds approximate (Ricklefs 1967, 1976). Ricklefs' method, applied to the nestling under observation, gives a growth rate constant of 0.353. This is lower (i.e. growth was somewhat slower) than the values given by Ricklefs (1976) for four Rusty-margined Flycatcher nestlings from Panama, which range from 0.370 to 0.414. The values for this species are close to the average for 40 neotropical passerine species (0.365; range 0.126–0.604) reported by Ricklefs (1976) and Oniki & Ricklefs (1981).

References:

- Dyrce, A. 1983. Breeding ecology of the Clay-coloured Robin *Turdus grayi* in lowland Panama. *Ibis* 125: 287–304.
- Dyrce, A. 1984. Breeding biology of the Mangrove Swallow *Tachycineta albilinea* and the Grey-breasted Martin *Progne chalybea* at Barro Colorado Island, Panama. *Ibis* 126: 59–66.
- Haverschmidt, F. 1971. Notes on the life history of the Rusty-margined Flycatcher in Surinam. *Wilson Bull.* 83: 124–128.
- Oniki, Y. & Ricklefs, R. E. 1981. More growth rates of birds in the humid New World tropics. *Ibis* 123: 349–354.
- Parker, T. A. 1982. Observations of some unusual rain-forest and marsh birds in south-eastern Peru. *Wilson Bull.* 94: 477–493.
- Ricklefs, R. E. 1967. A graphical method of fitting equations to growth curves. *Ecology* 48: 978–983.
- Ricklefs, R. E. 1976. Growth rates of birds in the humid New World tropics. *Ibis* 118: 179–207.

Address: Andrzej Dyrce, Department of Avian Ecology, Wrocław University, Sienkiewicza 21, 50-335 Wrocław, Poland.